SECTION A:	***QUALIFICATION DETAILS***																	
QUALIFICATION DEVELOPER (S)	WOO INTERNATIONAL																	
TITLE	CERTIFICATE III IN SOLAR PV INSTALLATIONS AND MAINTENANCE														***NCQF LEVEL***	3		
FIELD	MANUFACTURING, ENGINEERING & TECHNOLOGY			***SUB-FIELD***	RENEWABLE ENERGY										***CREDIT VALUE***	44		
New Qualification						√									*Review of Existing Qualification*			
SUB-FRAMEWORK	*General Education*						*TVET*				√	*Higher Education*						
QUALIFICATION TYPE	*Certificate*	*I*		*II*		*III*	√	*IV*		*V*		*Diploma*		*Bachelor*				
	Bachelor Honours					*Post Graduate Certificate*						*Post Graduate Diploma*						
	Masters							*Doctorate/ PhD*										

RATIONALE AND PURPOSE OF THE QUALIFICATION

RATIONALE:

HRD Sector Skills Plans (2017) indicators identifies demand for people with solar photovoltaic installation and maintenance at this level, to support productive safe work that contributes to economic growth of different sectors of the economy that are dependent on skilled human resources domain.

Labour statistics analysis list solar photovoltaic installation and maintenance as one of the occupational trades which are in high demand; on the other hand Government NDP 11 has identified various mega development projects that will require solar photovoltaic installation and maintenance services, and continues to encourage the use renewable energy as friendly green option. This thus raises demand for human resources with solar photovoltaic installation and maintenance competencies and qualified with a suit of skills required in these jobs.

The qualification could contribute to address the national problem of unemployed youth and increase the employability of graduates in certain vocational areas with acquisition of solar photovoltaic installation and

maintenance skills.

This qualification will further serve the needs of the society and the economy by providing solar photovoltaic installation and maintenance services.

It will help in producing competent learners who are able to contribute to improved productivity and efficiency within the engineering support environment. They will be able to work according to legislative, regulatory, quality assurance requirements and industry standards.

PURPOSE:

The purpose of this qualification is to provide learners with knowledge, skills and attributes required to work in renewable energy industry which includes installation, maintenance and repair of solar photovoltaic systems and components with an understanding of applicable legislation, regulatory and quality assurance standards.

Learner qualifying with qualification will be able to:

- Demonstrate knowledge of solar energy in photovoltaic system.
- Install solar photovoltaic system.
- Repair faults in a solar photovoltaic system.
- Undertake routine service of a solar photovoltaic system.

ENTRY REQUIREMENTS (including access and inclusion)

Entry to this qualification is open to the following criteria:

a) Certificate II in General Education (NCQF Level 2) or equivalence
b) There shall be consideration for RPL and CAT according to national RPL and CAT policies

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SECTION B	***QUALIFICATION SPECIFICATION***
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
1. Interpret technical drawings and plan	1.1 Observe requirements of regulations/ standards for solar photovoltaic system. 1.2 Interpret symbols, layouts and signs used in solar PV technology.
2. Apply principles of solar energy in a photovoltaic system.	2.1 Identify solar photovoltaic system components. 2.2 Locate electrical and electronic components used in solar PV systems. 2.3 Use connections for home solar system according to industry standards. 2.4 Store different PV system materials.
3. Install solar photovoltaic system	3.1 Install solar panels to a roof in accordance with industry specifications. 3.2 Install photovoltaic system according to industry specifications. 3.3 Install battery and charge controller in accordance with manufacturer's guidance.
4 Carry out maintenance of a solar photovoltaic system.	5.1 Check solar photovoltaic systems panels and connections for wiring continuity. 5.2 Replace batteries and charge controllers in accordance with industry practices. 5.3 Carry out scheduled maintenance for photovoltaic according to industry standards. 5.4 Repair minor faults of solar photovoltaic system in accordance with industry practices. 5.5 Complete maintenance check list in accordance with industry practices

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SECTION C	***QUALIFICATION STRUCTURE***				
COMPONENT	***TITLE***	***Credits Per Relevant NCQF Level***			***Total*** ***(Per** Subject/ Course/ Module/ Units)*
		Level [ ]	***Level [ ]***	***Level [ ]***	
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*	Occupational Safety in the workplace	***3***			2
	Technical drawings	***3***			2
	Working at heights	***3***			2
	Team and Interpersonal Skills	***3***			2
CORE COMPONENT *Subjects/Courses/ Modules/Units*	Introduction to Electricity	***3***			3
	Principles of Solar Energy		***4***		3
	Electrical Circuits	***3***			3
	Solar Photovoltaic systems	***3***			4
	Components of PV systems		***4***		4
	Batteries And Charge Controllers	***3***			3
	Solar Photovoltaic Installation		***4***		5
	Solar PV system repairs		***4***		5
	Solar PV system Maintenance	***3***			3
	Tools, equipment and Materials	***3***			3

ELECTIVE/ OPTIONAL COMPONENT *Subjects/Courses/ Modules/Units* **NB:** *Choose one module*					

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SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	***Credit Value***
3	***27***
4	**17**
TOTAL CREDITS	***44***

Rules of Combination:

(Please Indicate combinations for the different constituent components of the qualification)

This Certificate III in Solar PV Installations and Maintenance comprises 44 credits, comprising of Fundamental and Core Components

Fundamental Components:

The Fundamental components consist of foundational knowledge to the value of **08** credits which are compulsory

Core Components:

The core components consist of applied knowledge and practical skills to the value of **38** credits which are compulsory.

Elective Components:

There are no elective components for the qualification.

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ASSESSMENT ARRANGEMENTS

- Assessment will include both formative and summative modes.
- Formative assessment will contribute 50% to the overall course grade. Summative assessment will constitute the other 50% of the overall course grade.
- Assessment shall be carried out by BQA accredited Assessors.
- Assessment will be carried out in accordance with the institutional policies and in line with the national policy.

MODERATION ARRANGEMENTS

The sole purpose of moderation is to make sure that assessment and marking across all courses is fair, valid and reliable. It also aligns the assessment tool to the outlined learning outcomes, that it is set at an appropriate level of study and that the process of marking is consistently done.

- There will be both Internal Moderation and External moderation
- Moderation for assessment shall be carried out by BQA accredited moderators.
- Moderation will be done in accordance with the institutional policies and in line with the national policy

RECOGNITION OF PRIOR LEARNING

There is also provision for award of the qualification through RPL.

CREDIT ACCUMULATION AND TRANSFER

There is also provision for award of the qualification through CAT.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Horizontal Pathways

- Certificate III in Electrical Installations and Maintenance
- Certificate III in Solar Water Heating

Vertical Pathways

- Certificate IV in Solar PV Installations and Maintenance
- Certificate IV in Solar Water Heating

Employment Pathways

- Solar PV Installer
- Solar PV Artisan.

QUALIFICATION AWARD AND CERTIFICATION

A candidate is required to achieve a minimum of 44 credits (fundamental and core components) to be awarded Certificate III in Solar PV Installation and Maintenance qualification.

Certification

There will be issuance of a certificate and official transcript at award.

REGIONAL AND INTERNATIONAL COMPARABILITY

The proposed qualification generally compares well with all the qualifications studied since the exit outcomes cover similar scope and depth and are aligned to exit-level descriptors typical of this level and type of qualification as done within the region and beyond as well as competencies required for registration and accreditation with professional bodies such as Botswana Qualification Authority (BQA) and South African Qualification Authority (SAQA). However, what sets it apart from the qualifications examined, is that there is provision for application of attributes such as hands on and intense practice on every component which are critical for the current job market.

This qualification was compared with similar qualification in Africa and Beyond and below are the analysis of the comparison:

Similarities:

- Both qualifications have similar scope of learning.
- The employability skills or graduate profile for both qualification address the profession of a level 4 solar technician.
- Assessment strategy includes theory and practical assessment at the end of the programme.

Differences:

- SAQA has a total of 120 credits at level 5 while New Zealand qualification has 60 credits at level 4.

The new-Zealand qualification does not require any qualifications for entry requirements while SAQA need Level 4 as an entry requirements

REVIEW PERIOD

The qualification shall be reviewed every Five (5) years.

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